

F.3 Mathematics – Supplementary Worksheet for NCM 3A Chapter 5

Name: _____

Class: 3_____ ()

Date: _____

Level 1

1. A card is drawn at random from a pack of playing cards. What is the probability that the card is
- (a) a '2'?
 - (b) not a number card?
 - (c) not a red card?

(12 marks)

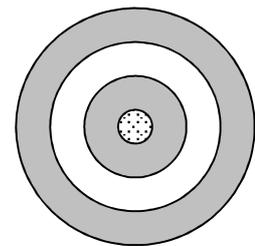
2. A number is randomly selected from the first ten multiples of 3. What is the probability that the number selected is
- (a) a multiple of 4?
 - (b) an odd number?
 - (c) less than 20?

(12 marks)

3. A bag contains 2 black balls and 3 balls of colours red, orange and green. Two balls are drawn from the bag at random. Find the probability that
- (a) one orange ball and one green ball are drawn,
 - (b) at least one ball drawn is black.

(12 marks)

4. A circular target has a radius of 35 cm. Its bullseye is a circle of radius 5 cm, and the widths of the other three rings are the same. Jane throws a dart randomly at the target and hits it. What is the probability that
- (a) she does not hit the bullseye?
 - (b) she hits the white region of the target?



(14 marks)

5. Some students are chosen randomly in a school and asked about what colours they like most. The results are as follows.

Colour	Red	Blue	Green	Yellow	Purple	Pink
Frequency	5	8	6	5	7	4

If a student in the school is chosen at random, what is the experimental probability that the student

- (a) likes purple?
- (b) likes red or pink?
- (c) does not like green, yellow or pink?

(12 marks)

6. A scientist wants to estimate the number of monkey in a forest. He caught 50 monkeys from the forest randomly and returned them after putting a mark on their bodies. After several days, he caught 20 monkeys from the forest and found that 4 of them had a mark. Estimate the number of monkeys in the forest.

(12 marks)

7. In a singing competition, the first prize is \$3 000, the second and the third prizes are \$1 500 and \$1 000 respectively. If Cindy is going to take part and estimates that the probabilities for her to get the first, the second and the third prizes are 0.3, 0.4 and 0.5 respectively, find the expected value of the prize she will get.

(8 marks)

8. A box contains eight \$1 coins, fifteen \$2 coins, twelve \$5 coins and ten \$10 coins. If a coin is drawn from the box randomly, what is the expected value of the coin?

(10 marks)

9. In a shooting game, players throw three darts at a target. If all three darts hit the bullseye, the player wins 120 coupons; if two darts hit the bullseye, the player wins 65 coupons; and if only one dart hits the bullseye, the player wins 10 coupons. Simon estimated that the probabilities of three darts, two darts and one dart hitting the bullseye are 0.05, 0.12 and 0.25 respectively, find the expected number of coupons that Simon will win.

(8 marks)

Level 2

1. A box contains 40 cards, 8 of them are squares, 14 are rectangles, 13 are circles and the rest are trapezium. Derek draw one card randomly from the box. What is the probability that the card picked is

- (a) a square?
 (b) either a circle or a trapezium?
 (c) neither a trapezium nor a rectangle?

(12 marks)

2. The table below shows the number of family members in an estate.

Number of family members	2	3	4	more than 4
Frequency	25	45	30	20

If a family is chosen randomly from the estate, what is the probability that the number of the family members is

- (a) 2?
 (b) less than 4?
 (c) more than 4?

(12 marks)

3. There are 3 red balls, 2 blue balls and 2 green balls in a bag. Two balls are drawn from the bag randomly. Find the probability that

- (a) the balls drawn are of the same colours,
 (b) at least one of the balls drawn is red.

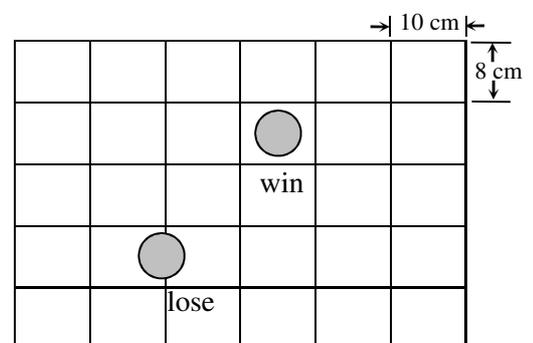
(16 marks)

4. There are three \$10 coins, two \$5 coins and one \$1 coin in Phoebe's pocket. She has just had a breakfast which cost \$12. If she picks out two coins from her pocket randomly, find the probability that the total value of these two coins are insufficient for paying her bill.

(12 marks)

5. In a stall game, the whole surface of a table is covered by rectangular tiles of dimensions 8 cm \times 10 cm as shown. Phoenix throws a metal disc of radius 3 cm onto the table. If the disc does not touch the side of any rectangle, she wins. If it touches a side, she loses. It is known that Phoenix throws the disc and it stays on the table, what is the probability that she wins the game?

(12 marks)



6. Two dice are thrown together and the difference of the score on each throw is recorded. The results are organized in the table below.

Difference	0	1	2	3	4	5
Frequency	4	6	8	7	7	3

Find the experimental probability that the difference of the score is

- (a) less than 3,
- (b) greater than 1 but less than 4,
- (c) either 5 or 0.

(12 marks)

7. A survey is conducted to record the clerk's usual ways of going to office.

Ways of going to office	Bus	Walking	MTR	Private car	Mini-bus	Other
Frequency	54	16	88	20	42	38

If a clerk is chosen, find the experimental probability that

- (a) the clerk goes to office on foot.
- (b) the clerk goes to office either by bus or by mini-bus.
- (c) the clerk goes to office neither by private car nor by MTR.

(12 marks)

8. Frank wants to buy a medical insurance. The insurance premium is \$1 800 annually. He estimates that the probabilities that he will spend money on the annual medical expenses of \$4 000, \$3 000, \$2 500, \$1 500 and \$700 are respectively 4%, 12%, 25%, 35% and 24%. Do you think Frank should buy the medical insurance?

(12 marks)

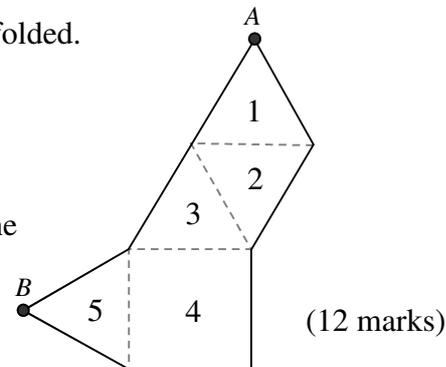
4. The figure on the right shows the net of a 3-D object. The net is then folded.

(a) Find the numbers on the faces that will coincide with

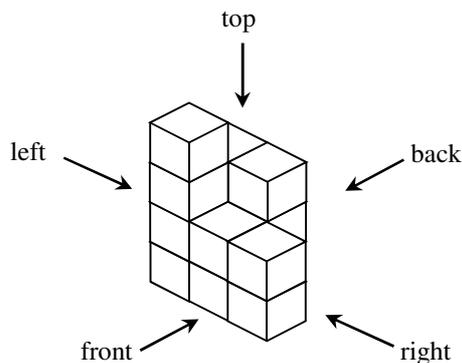
(i) the point *A*,

(ii) the point *B*.

(b) Find the numbers on the faces that are adjacent to the face with the number '1'.

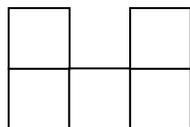


5. Draw the front, back, top, left and right views of the following 3-D object.

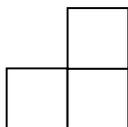


(12 marks)

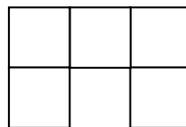
6. A 3-D object is made up of identical cubes. The figures below show three of its 2-D representations.



Front



Right



Top

(a) Sketch the corresponding 3-D object.

(b) How many cubes are there in the 3-D object?

(12 marks)

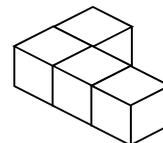
7. The figure on the right shows a 3-D object formed by cubes.

(a) If one cube is added to the object so that the new 3-D object formed has the property/properties given in each question below, sketch the new 3-D object formed.

(i) Rotational symmetry only.

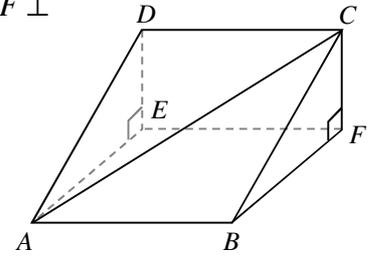
(ii) Both reflectional and rotational symmetry.

(b) Draw the top, front and right views of the new 3-D object for the cases in (a)(i) and (a)(ii).



(14 marks)

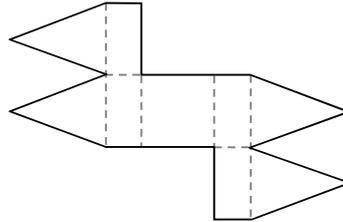
8. The figure shows a triangular prism. $ABCD$ and $ABFE$ are rectangles, $CF \perp BF$ and $DE \perp AE$.



- Find the projection of CA on the plane $ABFE$.
- Find the projection of CA on the plane $CDEF$.
- Name the angle between CA and the plane $ABFE$.
- Name the angle between CA and the plane $CDEF$.

(12 marks)

9. The following figure shows the net of a polyhedron. Find the number of faces, number of vertices and number of edges of this polyhedron.



(6 marks)